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Space Administration

John C. Stennis Space Center

Stennis Space Center, MS

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SPR 8500.1 Rev. C
October 2007

COMPLIANCE IS MANDATORY

John C. Stennis Space Center Environmental Management System Procedural Requirements

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Document History Log

Rev.	Change Date	Originator/Phone	Description
SPR 8500.1 Basic	10/22/04	Renay Nelson X 8-1585	Revalidated and correct per NASA Rules Review *Note: The original history of the prior Directive has been retained here to provide clarity and for tracking and reference purposes
A	12/30/2004	C. Kennedy x8-1445	Formatting and grammatical changes made throughout the document. Sections 1.2, 2.6, 2.7, 2.14 and 2.15 have been modified. These modifications reflect changes in audit and senior management review schedules. TTSC was changed to ITS and TOC. Changes were made to sections 2.10 and 2.14 to clearly describe CAR, PCAR and compliance assessments.
B	01/31/2006	C. Kennedy X8-1445	This document has been modified to align with the newly released headquarters' document NPR 8553.1 and the new ISO standard 14001-2004. The environmental policy has been modified to include statements on sustainability. Analytical Measurement and Test Equipment for calibration was reinserted into Section 2.7. Reworded and added the electronic record for external communications with regulators and other interested parties. Added information on the new Training and Legal section of the Risk Matrix database. Updated references for Internal Audits from SCWI-8500-0021-ENV to SCWI-1280-0001; and Corrective Action, Preventive Action and Improvement from SCWI-8500-0022-ENV to SCWI-8730-0002.
C	09/10/2007	C. Kennedy X8-1445	Revised Section 2.17 on reporting to senior management. Added responsibilities for NASA employees and NASA contractor employees. Updated references. Changed document for training requirements from

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			EMPP to Risk Matrix and operational desk guides. Removed EMS from many section headings. Changed Section 2.3 from setting O & T for other goals to other aspects deemed to contribute significantly. Moved Policy Statement to Section 1 and moved risk matrix development guidance from Section 2 to Appendix D.
Original History			
Basic SPG 8500.1	03/22/01	RA02/R.Magee Ext. 7384	Initial Release
SPG 8500.1 A	07/19/02	RA02/J.Gordon Ext. 8-1416	General writing, grammatical and format corrections throughout. Added SSC/NASA organizations and offices, ODIN and SS contracts to applicable support contractors participating in the EMS. Removed from references: SSLP-1440-0001, SSLP 8730-0004, SSLP-1280-0004, modified SSLP document numbers to remove the SLP number. Added to references: SPLN-8500-0001, SSC Environmental Functional Review Checklist. Updated doc number for the Integrated Contingency Plan. In section 1.2 added responsibilities to the SSC Environmental Officer (added c, d, e, f). In section 1.3 removed responsibilities from SSC EMS core team (e and f). In section 2.2, (i) was rewritten, and (j) was added. In section 2.3 responsibility for documenting EMPP objectives and targets was changed from the core team to the EO. Paragraph was removed which had said that objectives and targets could be established only to maintain compliance and record rationale for objectives and targets. In section 2.6, responsibility was changed for updating and reviewing operational controls to the Environmental Officer. Also corrected documentation reference. Section 2.10, Corrective/ Preventive Action and Improvement completely rewritten. Sections 2.13, 2.14, 2.15 and 2.16 were extensively revised. Sections 2.15.1, 2.15.2, 2.15.3 and 3.0

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			<p>were deleted. Sections 4.0 and 5.0 were changed to Appendices H and I respectively. In Appendix B, the column containing the identification number was removed. In Appendix G, divided general Lead Auditor term into Team Lead Auditor and EMS Lead Auditor, and requirements and responsibilities were added and revised. Info. falling under Other Criteria was also heavily revised.</p>
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PREFACE

P.1 PURPOSE

The purpose of this directive is to provide specific requirements for maintaining an Environmental Management System (EMS) for the John C. Stennis Space Center (SSC) in accordance with the ISO 14001, Environmental Management Systems – Requirements with Guidance for Use and NPD 8500.1, NASA Environmental Management.

P.2 APPLICABILITY

- a. This directive is applicable to NASA SSC personnel and activities.
- b. This directive is applicable to SSC contractors to the extent specified in their respective contractual documents.
- c. This directive covers all activities, products and services that fall under the control or influence of NASA/SSC management including, but not limited to, construction of facilities, facility maintenance and operations, procurement, research and development, testing, assembly, equipment maintenance, programs, mission deployment, and waste disposal.
- d. This EMS directive does not include programmatic activity by other government agencies and commercial operations that are located at SSC.

P.3 AUTHORITY

NPD 8500.1, NASA Environmental Management.

P.4 APPLICABLE DOCUMENTS

Referenced documents are assumed to be the latest revision unless otherwise specified.

- a. NPR 1441.1, NASA Records Retention Schedules.
- b. NPD 8500.1, NASA Environmental Management.
- c. NPR 8553.1, NASA Environmental Management System.
- d. SPR 1400.1, Document Preparation, Numbering, and Management.
- e. SPR 1440.1, Records Management Program Requirements.
- f. SPLN-1040-0006, Emergency Management Plan.

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- g. SPLN-1280-0001, Management Systems Annual Audit Plan.
- h. SCWI-1280-0001, Management System Internal Audits.
- i. SCWI-8500-0020-ENV, Environmental Integrated Contingency Plan.
- j. SCWI-8730-0002, Corrective Action, Preventive Action, and Improvement.
- k. SSLP-3410-0001, Training.
- l. SSLP-8720-0001, Control of Inspection, Measuring, and Test Equipment.
- m. ISO 14001, Environmental Management Systems – Requirements with Guidance for Use.

P.5 MEASUREMENT/VERIFICATION

Compliance with the requirements contained in this document will be verified through audits, observations, and self assessments.

P.6 CANCELLATION

SPR 8500.1, Rev. B

Signature on File

Robert D. Cabana
Director

DISTRIBUTION

Approved for public release via NODIS; distribution is unlimited.

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CHAPTER 1. ENVIRONMENTAL POLICY AND EMS RESPONSIBILITIES

1.1 Environmental Policy

a. It is the policy of SSC to conduct its mission, services, and activities in a manner that maintains environmental stewardship of assets and fully discharges its environmental responsibilities. SSC has implemented this policy through an EMS based on four foundation principles:

1. **Regulatory Compliance** with all applicable federal, state, and local environmental laws and regulations and other requirements;
2. **Conservation** of our resources so that we meet our current and future mission in a sustainable manner,
3. **Pollution Prevention** to cost-effectively avoid the creation of pollution; and
4. **Continual Improvement** of processes to enhance environmental protection.

b. This policy serves as the framework for setting and reviewing environmental objectives and targets.

c. The SSC EMS is focused on significant environmental parameters including but not limited to:

Conservation and Sustainability: We will diminish our consumption of natural resources through cost-effective use of recycled and reused materials, affirmative procurement, and conservation of energy and water. We manage our natural resources in a sustainable manner for current and future generations. We design and operate our facilities with view on total life cycle costs.

Restoration: We will strive to protect and restore the natural and cultural resources located on SSC property including habitats, wetlands, and other sensitive ecological resources in accordance with applicable regulations and local ordinances.

Emissions, Effluents, and Waste: We will work to diminish our emissions effluents, and waste throughout the lifecycle of our projects and operations by employing cost-effective operational controls, by selecting appropriate materials and by implementing corrective and preventive actions for legal issues whenever necessary.

Technology Transfer : We will promote the development and transfer of environmentally related technology that may have broad applicability for environmental protection and restoration throughout society.

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d. We will communicate this policy to all employees, make it available to the public, and maintain procedures to receive and respond to inquiries from external interested parties. We will also alert potentially affected individuals and authorities of any environmental incidents in a timely and effective manner.

e. Senior Management at SSC believes that how we care for the environment today affects both current and future generations. We accept responsibility for doing our best to maintain awareness and to minimize adverse environmental impacts from our operations.

1.2 Responsibilities

The responsibilities for the implementation and maintenance of the EMS are addressed below.

1.2.1 SSC Director

The SSC Director is responsible for appointing the SSC NASA Environmental Officer (EO) as the Management Representative to oversee the continual operation of the EMS and the members of the EMS Core Team.

1.2.2 Senior Management

Senior Management is responsible for:

- a. Participating in the EMS program by providing commitment to its continuing operation; and
- b. Conducting reviews at least once a year to ensure the suitability, adequacy and effectiveness of the EMS.

1.2.3 SSC Environmental Officer

The SSC Environmental Officer (EO) serves as the Management Representative to direct the EMS and Core Team activities. Specifically, the EO is responsible for:

- a. Identifying the need for and documenting procedures for operational controls that limit adverse impacts associated with environmental aspects and which are needed to manage NASA's environmental policy or compliance activities;
- b. Reporting annually to Senior Management on the state of the EMS or more frequently as preferred;
- c. Overseeing communications with external interested parties;

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- d. Tracking the investigation and correction (as needed) for all reported hazards/emergencies;
- e. Identifying requirements for, and participating in the SSC Corrective Action, Preventive Action and Improvement process, in accordance with SCWI-8730-0002;
- f. Appointing the EMS Audit Manager;
- g. Identifying EMS internal audit requirements to the EMS Audit Manager in accordance with SCWI-1280-0001; and
- h. Providing support to NASA Headquarters during environmental functional reviews.

1.2.4 SSC EMS Core Team

The SSC EMS Core Team assists in managing the EMS. The Core Team membership includes representatives from NASA Environmental Management, NASA Engineering and Science Directorate and the NASA contractors responsible for operational activities. Other NASA Directorates or NASA contractors may be consulted on an as needed basis. The Core team membership is limited to no more than 12 members at any one time. The EMS Core Team is responsible for:

- a. Identifying high-priority environmental impacts;
- b. Establishing environmental objectives and targets for SSC high-priority impacts that are consistent with the NASA environmental policy;
- c. Assisting the Environmental Management Program Plan (EMPP) Managers to develop performance indicators for environmental objectives and targets; and
- d. Reviewing and updating operational controls associated with high-priority environmental impacts on an as needed basis.

1.2.5 Environmental Management Program Plan Manager(s)

The EMPP Manager(s) is responsible for:

- a. Establishing performance baselines for environmental objectives and targets with the assistance of appropriate SSC environmental program personnel;
- b. Tracking, monitoring, and measuring the key characteristics of operations associated with the environmental objectives and targets and reporting this information to the EO as requested; and

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c. Reviewing and maintaining the EMPP document to ensure it remains current and in conformance with the requirements of SPR 1400.1.

1.2.6 SSC Audit Manager

The Audit Manager is responsible for organizing EMS audits according to SCWI-1280-0001, Management System Internal Audits.

1.2.7 NASA Employees and NASA Contractor Employees

NASA employees and NASA contractor employees are responsible for being knowledgeable of the NASA Environmental Policy, understanding the environmental aspects related to their jobs, and working to minimize their impact on the environment.

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CHAPTER 2. PROCEDURES

2.1 High-Priority Environmental Aspect Identification

- a. The SSC EMS Core Team shall document information to verify and validate the assignment of high-priority environmental impacts using the Risk Matrix database format in Appendix B.1 and Risk Matrix Development Guidance in Appendix D.
- b. The EO and the EMS Core Team shall meet on an annual basis to review the risk matrix and recommend additions or alterations based on changes in mission, activities, products, processes, or services.

2.2 Environmental Objectives and Targets

- a. The EMS Core Team, with the guidance of the EO, shall establish environmental objectives and targets that are technically feasible and economically reasonable for each high-priority environmental aspect and for any other aspect deemed to contribute significantly to environmental performance. Section 3.3.3 of NPR 8553.1 describes the requirements for selection of objectives and targets.
- b. The EO shall document in an EMPP the objectives and targets for the high-priority aspects and communicate the information to all affected parties.
- c. Any updates or changes to objectives and targets resulting from the annual management review and internal EMS audits shall be incorporated into the EMPPs and communicated by the EO to all affected parties.

2.3 Environmental Management Program Plan

An EMPP shall be prepared that specifies the basic requirements for designating responsibilities and establishing means and timeframes for achieving objectives and targets. Requirements for EMPPs are provided in Section 3.4.3 of NPR 8553.1.

2.4 Legal and Other Requirements

- a. The facilities contractor shall be contractually tasked to review federal and state regulations through appropriate web sites and subscription e-mail services to ensure that representatives of NASA Environmental Management are aware of new or modified requirements.
- b. NASA Environmental Management shall track and review any other requirements applicable to SSC operations and activities such as NASA Headquarters directives and Executive Orders.

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- c. Any rules or regulations that are identified as potentially relevant to SSC operations shall be brought to the attention of the EO.
- d. The EO shall communicate this information to those individuals who are primarily responsible for meeting the requirements in the affected area.
- e. Legal and other requirements shall be included in the Risk Matrix (format is shown in Appendix B.2).

2.5 Operational Controls

- a. The EO shall ensure that operational controls are available for each high-priority environmental aspect and for aspects that need controls to prevent them from becoming high priority.
- b. Operational controls may be technological, operational or procedural and shall be documented and made available to employees via the SSC Technical Documentation System.
- c. The procedures shall be reviewed and updated as necessary by NASA Environmental Management.
- d. Procedures shall be prepared and kept current per SPR 1400.1, Document Preparation, Numbering, and Management.

2.6 Calibration, Monitoring and Measuring Equipment

Equipment used for sample analysis or performance monitoring shall be calibrated in accordance with one of the following:

- a. Inspection, Measurement and Test Equipment (IM&TE) is calibrated in accordance with SSLP-8720-0001, Control of Inspection, Measuring, and Test Equipment.
- b. Analytical Measurement and Test Equipment (AM&TE) is calibrated using certified reference materials or consensus standards supported by a test procedure. Traceability to the certified reference material or consensus standard shall be documented by the analytical laboratory for each analysis or performance monitoring process. AM&TE is not included in the Stennis metrology management system.

2.7 Document Control

All EMS documents shall be created, revised, and cancelled according to SPR 1400.1, Document Preparation, Numbering, and Management.

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2.8 Records

- a. EMS records shall be managed in accordance with relevant federal and state regulations, NPR 1441.1, NASA Records Retention Schedules, and SPR 1440.1, Records Management Program Requirements.
- b. Logs shall be controlled in accordance with specific work instructions or the appropriate regulatory requirement.

2.9 Corrective/Preventative Action and Improvement

- a. Corrective action is used to effectively handle non-compliance and non-conformance issues by addressing and identifying the root cause of the discrepancy. The primary objective of preventive action is to minimize impending, emerging, or potential problems or issues that may increase program or management risk. While corrective action starts with a known fault that must be fixed, preventive action resolves a potential problem or concern that must be eliminated to avoid or prevent a fault.
- b. Corrective/preventative actions and improvements that are identified during internal or external audits shall be managed according to SCWI-8730-0002, Corrective Action, Preventive Action, and Improvement.
- c. Some corrective/preventative actions and improvements are also identified by regular SSC communication processes, NASA Headquarters Environmental Functional Reviews, state and federal environmental inspections and other similar means. In these situations the need for formal corrective or preventative action, according to SCWI-8730-0002, shall be based on the magnitude of the issue as determined by NASA Environmental Management.

2.10 Training

- a. Training requirements to provide the needed competencies to execute the requirements of the EMS shall be determined, conducted and recorded in accordance with SSLP-3410-0001, Training.
- b. Employee competency shall be ensured by new employee EMS awareness training, EMS refresher training and other EMS competency training requirements listed in the Training and Legal Report located in the Risk Matrix database.
- c. The competency training requirements are specified in the Risk Matrix database (format is shown in Appendix B.2) and in operational desk guides. Competence training shall include:
 - 1. Professional certification necessary to be in compliance with the law;

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2. Environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;
3. Roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements; and
4. The potential consequences of departure from specified operating procedures.

2.11 Emergency Preparedness

Emergency procedures at SSC shall be governed by SPLN-1040-0006, Emergency Management Plan and SCWI-8500-0020-ENV, Environmental Integrated Contingency Plan.

2.12 Tracking Environmental Performance

- a. As part of establishing EMPP documents for environmental impacts, the EMS Core Team shall assist the EMPP Manager in determining performance indicators to show progress toward meeting EMPP objectives and targets.
- b. Units of measure and types of measurement found in environmental regulations for a particular high-priority environmental aspect shall be used in establishing these indicators and in determining their baselines.
- c. The EMPP Manager shall record progress toward meeting objectives and targets using graphs, charts, or reports.
- d. The EO shall establish data requirements for submittal of records that track, monitor and measure key environmental parameters associated with SSC operations.

2.13 Compliance Assessments

- a. NASA SSC Environmental Management and NASA Headquarters Environmental Management shall conduct assessments on all NASA and NASA contractor operations to assure that SSC activities comply with federal and state regulations.
- b. NASA SSC Environmental Management shall notify senior management and NASA Headquarters if any issues regarding noncompliance are discovered during assessments.
- c. The EO shall initiate corrective action and issue a cease and desist order on any non-compliant activities.

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- d. Compliance assessments of NASA and NASA contractors shall be conducted at least once per year, and may be conducted in conjunction with internal audits.
- e. Problems identified during assessments shall be assigned a preventative action or a corrective action depending on the severity of the assessment observations.
- f. Compliance problems that are discovered by observations made at times other than during annual assessments shall be addressed immediately and assigned a preventative action or a corrective action depending on the magnitude of the problem.
- g. NASA and its contractors shall be scored during compliance assessments on environmental compliance issues specific for each process. The score is based on the percentage of criteria in compliance versus the total number of compliance criteria identified for each process.

2.14 Internal EMS Audits

Internal EMS audits of NASA and NASA contractors shall be conducted in accordance with SCWI-1280-0001, Management System Internal Audits and SPLN-1280-0001, Management Systems Annual Audit Plan.

2.15 Internal Communications

- a. Internal communications to NASA and NASA contractors with respect to the EMS shall include the environmental policy, objectives and targets, roles and responsibilities, performance tracking and emergency response.
- b. Mechanisms that shall be used for internal communication are the environmental website, newsletters and emails, staff meetings, bulletin boards, posters and flyers.
- c. All SSC personnel shall communicate any environmental concerns directly to their manager, their organization's environmental lead, directly to the EO, via a corrective action form or through comments to the SSC "Close Call" System.
- d. Appropriate responses shall be provided to all environmental concerns expressed by personnel.
- e. All employees shall report environmental hazards or emergencies, including spills and fires, immediately upon discovery by dialing 911 in accordance with the SCWI-8500-0020-ENV, SSC Environmental Integrated Contingency Plan.

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2.16 External Communications

- a. The NASA Senior Management Council has directed NASA Environmental Management to provide the public with information on the EMS significant aspects. These aspects, the EMS objectives and targets, and environmental performance indicators shall be made available to the public via the Environmental Assurance web site and through the annual reports for the Environmental Protection Agency's (EPA) National Environmental Performance Track Program.
- b. NASA Environmental Management, through the procurement offices of NASA and NASA contractors, shall inform SSC suppliers or other contractors of its EMS and of NASA's desire that they conduct their business in an environmentally sound manner applying applicable procedures and requirements to mitigate, minimize, or otherwise control environmental impacts.
- c. Outreach is also accomplished for National Environmental Policy Act requirements such as environmental assessments and environmental impact statements by posting documents on the web site and providing them to local libraries for public review. If necessary, public scoping or comment sessions shall be conducted locally.
- d. The requirements of the Comprehensive Environmental Response, Compensation, and Liability Act shall be fulfilled by offering poster sessions and fact sheets to the public and by providing information via the web site.
- e. The NASA Environmental Management staff shall keep records of incoming and outgoing phone communications and emails, regarding environmental compliance issues, with the EPA, the U.S. Army Corps of Engineers, the Mississippi Department of Environmental Quality, the Mississippi Department of Health and other federal and state agencies.
- f. Records of communications shall be maintained electronically on the Center Operations Directorate network drive and managed in accordance with NPR 1441.1, NASA Records Retention Schedules.
- g. Public inquiries regarding environmental issues shall be directed to the SSC Public Affairs Officer. This includes emails, faxes and telephone calls.

2.17 Management Review

- a. Senior management shall review the EMS at least annually to ensure its continuing suitability, adequacy, and effectiveness.
- b. As part of the review the EO shall brief senior management on:
 - results of internal audits and evaluation of compliance with legal and other requirements
 - communication from external parties, including complaints

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- environmental performance and the extent to which objectives and targets have been met
- status of corrective and preventive actions
- follow-up actions from previous management reviews
- changing circumstances, including developments in legal and other requirements
- recommendations for improvement

c. Upon review of the information provided by the EO, senior management shall provide guidance and direction to the EO on possible changes to the EMS to ensure its continual improvement.

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Appendix A – Acronyms

AM&TE	Analytical Measurement and Test Equipment
EMPP	Environmental Management Program Plan
EMS	Environmental Management System
EPA	Environmental Protection Agency
EO	Environmental Officer
IM&TE	Inspection, Measuring and Test Equipment
ISO	International Organization of Standardization
NASA	National Aeronautics and Space Administration
NODIS	NASA Online Directives Information System
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
SCWI	Stennis Common Work Instruction
SPG	Stennis Procedures and Guidelines
SPLN	Stennis Plan
SPR	Stennis Procedural Requirements
SSC	Stennis Space Center
SSLP	Stennis System Level Procedure

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Appendix B – Database Format

B.1 Risk Matrix

Building Organization					Point of Contact Phone			Manager Phone	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Activity, Product, and Service	NASA Prescribed Aspect	Aspect	Impact	Group Impact	Environmental Consequence Category	Severity	Frequency	Overall Risk Ranking	Objectives and Targets

B.2 Training and Legal Format

Aspect	NASA Prescribed Aspect	Legal and Regulatory	Training

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Appendix C - Grouped Impacts Acronym List

Acronym	Description
AE/DAQ/O	Air Emissions/Degradation of Air Quality/Ozone depleting substance
AE/DAQ/ Asbestos	Air Emissions/Degradation of Air Quality/Asbestos
AE/DAQ/CN	Air Emissions/Degradation of Air Quality/Carbon Monoxide, Nitrogen Oxides, Sulfur Dioxide
AE/DAQ/CO	Air Emissions/Degradation of Air Quality/Carbon Dioxide
AE/DAQ/HAPS	Air Emissions/Degradation of Air Quality/Hazardous Air Pollutants
AE/DAQ/PM	Air Emissions/Degradation of Air Quality/Particulate Matter
AE/DAQ/SM	Air Emissions/Degradation of Air Quality/Smoke
AE/DAQ/V	Air Emissions/Degradation of Air Quality/Volatile Organic Compound
AP/CNR	Affirmative Procurement/Conservation of Natural Resources
AW/RLS	Asbestos Waste/Reduction in Landfill Space
BFS/SWC	Bulk Fuel Storage/Soil and Water Contamination
BT/SWC	Batteries (wet cell batteries)/Soil and Water Contamination
CRD/DCR	Cultural Resource Disturbance/Destruction of Cultural Resources
EMF/HS	Electromagnetic Force Emissions/Health & Safety
EO/SWC	Erosion Control/Soil and Water Contamination
EP/HS	Explosion potential/Health and Safety (human)
EUC/RNR	Energy Usage (Chemical)/Reduction in Natural Resources
EUE/RNR	Energy Usage (Electricity)/Reduction in Natural Resources
EUGD/RNR	Energy Usage (Petroleum – gasoline, diesel)/Reduction in Natural Resources
F/SWC	Fueling/Soil and Water Contamination
HU/SWC	Herbicide Usage/soil and Water Contamination
NRU/RNR	Natural Resource Use/Reduction in Natural Resources
NRUHE/RNR	Natural Resource Use (Helium)/Reduction in Natural Resources
NRUN/RNR	Natural Resource Use (Nitrogen)/Reduction in Natural Resources
NRUOX/RNR	Natural Resource Use (Oxidizers)/Reduction in Natural Resources
POL/SWC	Petroleum, Oil and Lubricants (POL) Storage/Soil and Water Contamination
PWU/DG	Portable Water Usage/Depletion of Groundwater
RAD/HS	Radiation Emissions/Health and Safety
RB	Batteries (recycling)
RC	Cardboard/Corrugated (recycling)

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Acronym	Description
RCFC	Chlorofluorocarbon (recycling)
RIC	Ink/toner Cartridges (recycling)
RM	Metals (recycling)
RP	Paper (recycling)
RS	Silver (recycling)
RTI	Tires (recycling)
HWA/SWC	Hazardous Waste Accumulation/Soil and Water Contamination
SF/DWC	System Failure/Drinking Water Contamination
SW/RLS	Solid waste generation/reduction in landfill space
UNP/CNR	Use of native plants/conservation of natural resources
UOS/CNR	Used oil storage/conservation of natural resources
UOS/SWC	Used oil storage/soil and water contamination
WD/DW	Wetlands disturbance/wetlands destruction
WW/SWC	Wastewater/soil and water contamination
CS/SWC	Chemical storage/soil and water contamination
CUH/REM	Clean-up hazardous waste/remediation
EUNG/RNR	Energy usage (natural gas)/reduction in natural resources
SFU/RNR	Surface water usage/reduction in natural resources
SC/SWC	Spill containment/soil and water contamination

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Appendix D – Risk Matrix Development Guidance

The following steps shall be taken to complete and maintain the Risk Matrix to identify high-priority environmental impacts for the EMS:

1. Identify all activities, products, and services associated with the inputs, processes, and outputs under the control of NASA/SSC (Column 1 of the Risk Matrix). Although completed by the SSC EMS Core Team, this step may require input from managers, supervisors, and employees because of their knowledge of the SSC operations and functions.
2. Complete Column 2 of the Risk Matrix at the end of this process (see step 12).
3. Identify all environmental aspects in Column 3 using the activities, products, or services identified in Column 1 of the Risk Matrix. Give consideration to both normal and abnormal situations.
4. Identify in Column 4 of the Risk Matrix any real and/or potential environmental impacts for each of the aspects listed in Column 3.
5. To ease the evaluation of impacts, similar impacts that arise from several distinct activities, products or services are grouped together. The EMS Core Team shall assign each of these grouped impacts an acronym, which is placed in Column 5 of the Risk Matrix. The acronyms and the associated grouped impacts are listed in Appendix C.
6. All individual impacts and grouped impacts are classified into one or more of six consequence categories in Column 6 of the Risk Matrix. These categories are listed and defined in Section 3.1.3.4 of NPR 8553.1.
7. Review the environmental aspects to determine applicable legal and training requirements. This information is kept as a subset in the Risk Matrix. The format is provided in Appendix B.2.
8. Assign a numerical “severity” ranking in Column 7 of the Risk Matrix using the table in Section 3.1.3.5 of NPR 8553.1 to the individual and grouped impacts. This ranking is based on the worst-case scenario of an environmental impact that is not being properly managed; however, for beneficial impacts, the consequence can be the consequence avoided.
9. Assign in Column 8 of the Risk Matrix a numerical “frequency” ranking using the table in Section 3.1.3.5 of NPR 8553.1 to the individual and grouped impacts. Negative impact ranking is based on the frequency of the worst-case scenario occurring with consideration given to historical records and operational controls. Positive impact ranking is based on the frequency of the optimal situation occurring.

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10. Place an overall risk rank in Column 9 of the Risk Matrix. The overall risk ranking is determined by assigning a “risk” of high, medium, low, or very low to each aspect based on frequency and severity factors. The Risk Ranking Matrix used for this determination is in Section 3.1.3.7 of NPR 8553.1.

11. In Column 10 of the Risk Matrix, activities, products and services are selected as having high priority impacts requiring specific objectives and targets, if the “risk” assigned to the activity is “High.”

12. With all the information identified above in the Risk Matrix, the EMS Core Team classifies the environmental aspects listed in Column 3 into NASA defined aspects as found in Section 3.1.3.3 of NPR 8553.1. This information is now placed in Column 2 of the risk matrix.